Surviving Scientific Scrutiny

Left: JSC scientists David McKay, Everett Gibson and Kathie Thomas-Keprta look through the "Martian Chronicles." The chronicles are eight volumes of letters, articles and awards the team has cataloged during the 11 months since the announcement of their discovery of evidence of primitive life on Mars.

By Karen Schmidt

In August of 1996, a team of JSC scientists revealed they may have found evidence of primitive life on Mars. Since the announcement, the lives of planetary scientists David McKay, Everett Gibson and Kathie Thomas-Keprta have not been the same.

"It has been almost one year since our original paper was published and our hypothesis has survived more or less intact and is still the topic of a major scientific debate," McKay said. "The concepts and interpretations that we proposed have activated the scientific community to investigate and debate many aspects of possible life on Mars, in extreme environments on and within the Earth, and in other locations in our own and other star systems."

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The JSC team and six other NASA and university research partners spent two years investigating the mineral features of a rock—believed to be of Martian origin—that fell to Earth as a meteorite. The minerals suggest biological activity and possible microscopic fossils of primitive, bacteria-like organisms that may have existed more than 3.6 billion years ago.

"While our interpretations have been challenged, our data have not been significantly criticized," McKay said. "Many critics remain, and undoubtedly new ones will arise, but we contend that our original interpretation remains the simplest and most encompassing hypothesis for explaining the complex and diverse data on this meteorite."

McKay and Gibson are at NASA's Jet Propulsion Laboratory, anxiously awaiting scientific results from Mars Pathfinder.

"Pathfinder will characterize the Martian surface," Gibson said. "It will not answer any of the questions which we have posed but it is one in a series of precursor missions that we need to do to get ready to get return samples from Mars. We hope it goes well."

Thomas-Keprta will watch the mission results carefully, looking for the same mineral she discovered in the Mars meteorite.

"Pathfinder has a magnetic experiment on it and the scientists will be looking for magnetite on Mars," she said. "It will be very interesting to see if any grains stick to these magnets and confirm that magnetite does exist on Mars."

The team was surprised by the reaction of media and the public, but is ecstatic about the excitement its research has generated within the science community.

"What is exciting is that we have got biologists talking to geologists and chemists," McKay said. "I have gone to universities to give a talk and the biology group will show up and the geologists will come. They almost never talk to each other inside the university. Yet, they come to this talk and start arguing back and forth, and I love that. Our research has produced a multidiscipline focus."

Of all the awards the team has received, Gibson said the most gratifying aspect of the discovery is respect shown by his scientific colleagues.

"When they see me at a meeting, my scientific peers and colleagues say y'all did that well and you did it the right way," he said. "It makes one feel good and it's very satisfying."

The announcement has generated new research, and the team welcomes the challenges to the concepts of ancient life on Mars.

"We ourselves want to make sure that we have come up with the right answer," Thomas-Keprta said. "If you do good science you will produce more questions than answers and that's what we have done. Any day that I come in and have more questions than answers is a good day."

Since the Aug. 7, 1996, announcement, the team of nine scientists has conducted more than 500 interviews and presentations. Interviews range from a telephone interview with Vatican Radio to a talk before the Swedish National Research Council that awards Nobel Prizes.

"The number of requests for our time came as a surprise to us," Gibson said. "We have spoken to audiences as large as 5,000. We have given briefings to Congress, the National Academy of Sciences and have spoken to groups all over the world."

While the travel, interviews and presentations have cut into their research time, Thomas-Keprta said it's important and rewarding.

"Both jobs need to be done and both parts are important," she said. "The general public cannot understand a science paper, but they do understand a slide show."

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Requests for interviews and presentations continued at a hectic pace at the beginning of the year but McKay had to call it quits in March when he underwent heart surgery.

His recovery is going well and he has recently returned to work full time, but is limiting his travel.

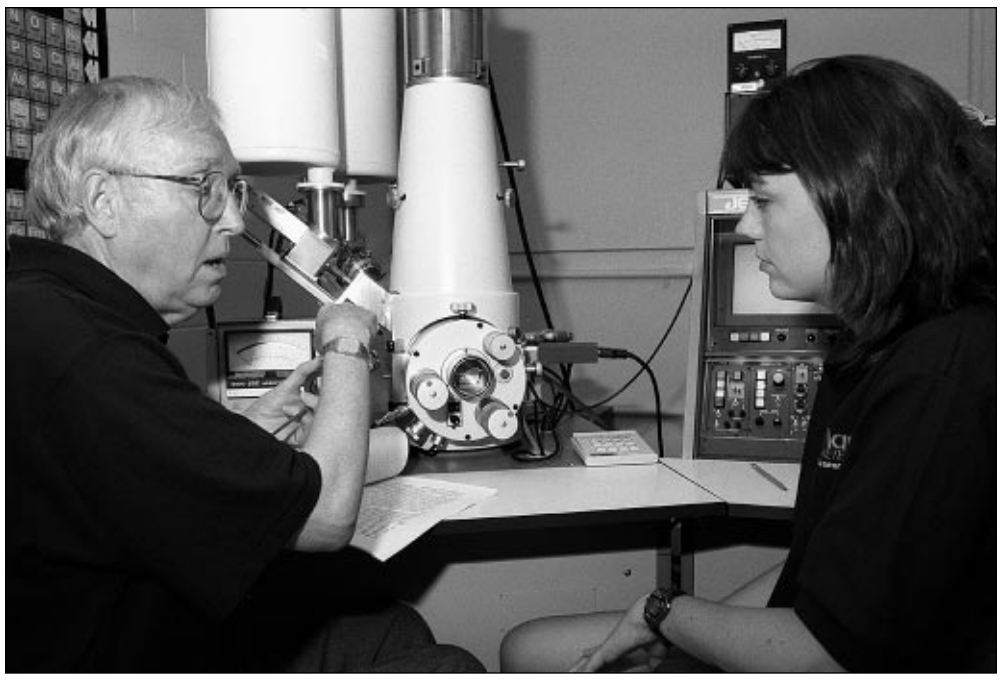
"I am making an effort to avoid stressful situations; I just go home or chase people out of my office," he said.

The group found it difficult to keep up with all the letters, articles and awards until Gibson began collecting them in four-inch binders. He recently completed volume eight of what he calls the "Martian Chronicles."

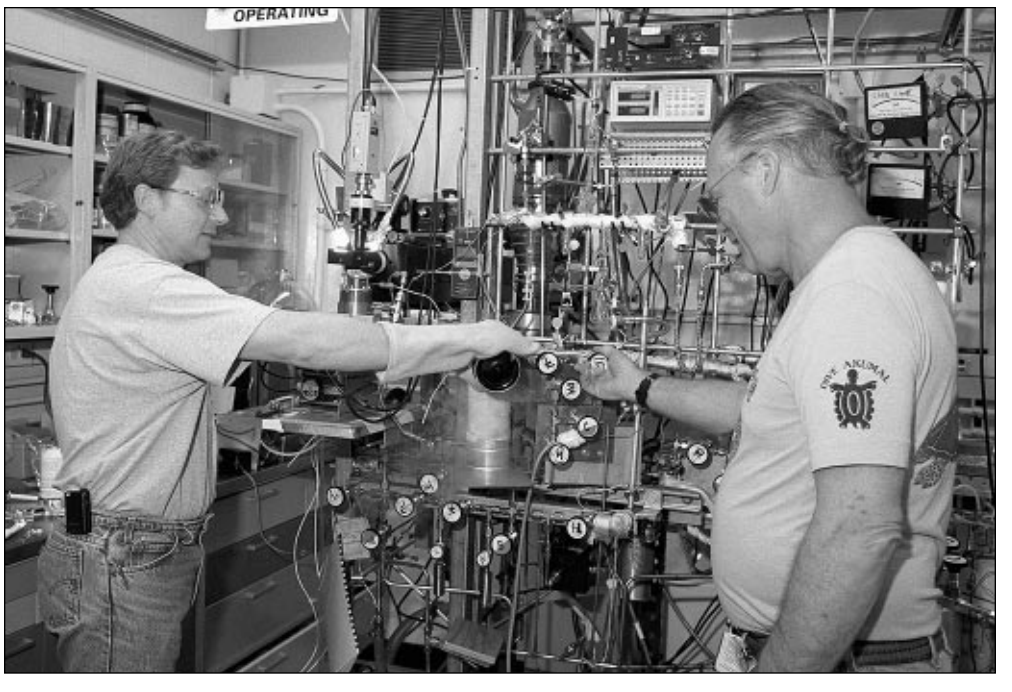
The team also has garnered numerous awards. In May, the National Space Society presented the Space Pioneer Award, which recognized not only the JSC scientists but their colleagues as well, including Hojatollah Vali of McGill University in Montreal; Chris Romanek from the University of Georgia; and Richard Zare and his students Simon Clemett, Claude Maechlin and Xavier Chiller of Stanford University.

"Their findings galvanized interest in Mars, space exploration and scientific discovery," said David Brandt, executive director for the National Space Society. "But even more importantly, their story demonstrates how continued investment in technology gives us the opportunity to take a second look, to challenge long-standing assumptions and to expand knowledge."

"Time" magazine awarded the scientists the Best of Science of 1996 while "Discover" magazine gave the team both the Find of the Century Award and the Top 1996 Science Story. "Aviation and Space" lauded the find



Above left: McKay instructs Kate Graham, a summer intern, on how to insert samples into the scanning electron microscope. Graham will spend the summer investigating rocks from Yellowstone that will help the team understand how samples live in hot hydro-thermal areas. The team is focusing its attention on Earth rocks to verify the Mars discovery.



Above right: From left, Rick Socki of Lockheed Martin, with the help of Geology professor Eugene Perry from Northern Illinois University, pours nitrogen into a vacuum extraction line to separate gases.